## CLAIMS

WHAT IS CLAIMED IS:

1. A method of producing a grating in a selected portion of an optical fiber, the method comprising the steps of:
   a) placing the selected portion of the optical fiber in a hydrogen containing atmosphere;
   b) heating the volume of the hydrogen-containing atmosphere immediately surrounding only the selected portion of the optical fiber to a temperature of at least 250°C; and
   c) exposing only the selected portion of the optical fiber to the heated volume of the hydrogen-containing atmosphere at a temperature of at least 250°C for a predetermined time.
2. The method of claim 1, further comprising the step of exposing the selected portion to a pattern of actinic radiation.
3. The method of claim 1, further comprising the step of advancing the selected portion of the optical fiber out of the loading chamber after the exposing step.
4. The method of claim 1, further comprising the step of rapidly cooling the selected portion after the step of exposing.
5. The method of claim 1, wherein the optical fiber has a first selected portion and a second selected portion, further comprising the step of advancing a second selected portion of the optical fiber into the loading chamber after the exposing step has been completed for the first selected portion.
6. The method of claim 5, further comprising the step of repeating steps a through c for the second selected portion of optical fiber.
7. The method of claim 1, the optical fiber having a depolymerizable coating, further comprising heating the selected portion of the fiber and depolymerizing the coating of the selected portion.
8. The method of claim 7, further comprising the step of placing the selected portion of the coating in an oxygen-free atmosphere.
9. The method of claim 8, wherein the atmosphere comprises inert gases.

10. The method of claim 1, wherein the optical fiber is loaded into a reel to reel inline system.

11. A method for increasing the photosensitivity of a selected portion of an optical fiber, the method comprising the steps of:

a) placing at least the selected portion of the optical fiber in a hydrogen containing atmosphere;

b) heating the volume of the hydrogen-containing atmosphere immediately surrounding only the selected portion of the optical fiber to a temperature of at least 250°C; and

c) exposing only the selected portion of the optical fiber to the heated volume of the hydrogen-containing atmosphere at a temperature of at least 250°C for a predetermined time.

12. The method of claim 11, wherein only the selected portion of the optical fiber is placed in the hydrogen-containing atmosphere.

13. The method of claim 11, wherein the step of placing includes placing at least the selected portion of the optical fiber in a loading chamber, the method further comprising the step of rapidly changing the atmosphere surrounding the selected portion after the exposing step.

14. The method of claim 13, wherein the step of rapidly changing the atmosphere includes venting the hydrogen-containing atmosphere from the loading chamber.

15. The method of claim 13, wherein the step of changing the atmosphere includes removing the selected portion from the loading chamber.

16. The method of claim 11, further comprising the step of rapidly cooling the selected portion of the optical fiber after the predetermined time.

17. The method of claim 16, wherein the step of cooling includes replacing the hydrogen containing atmosphere with a cooled inert gas.

18. The method of claim 16, wherein the step of cooling includes placing the selected portion in a cooling region.

19. The method of claim 11, further comprising the step of physically affixing to the optical fiber at least one pressure seal adapted to help contain a gaseous atmosphere within the loading chamber

20. The method of claim 19, wherein the at least one pressure seal is located at a boundary between the selected portion of the optical fiber and a non-selected portion.

21. The method of claim 11, wherein the step of placing including physically affixing at least one pressure seal adjacent the selected portion of the fiber, the seal adapted to help contain a gaseous atmosphere within the loading chamber.

22. The method of claim 11, wherein at least one re-closable seal is in contact with the optical fiber during the exposing step.

23. The method of claim 22, wherein the at least one re-closable seal is located at a boundary between the selected portion of the optical fiber and a non-selected portion.

24. The method of claim 22, wherein the at least one re-closable seal comprises an elastomeric collet.